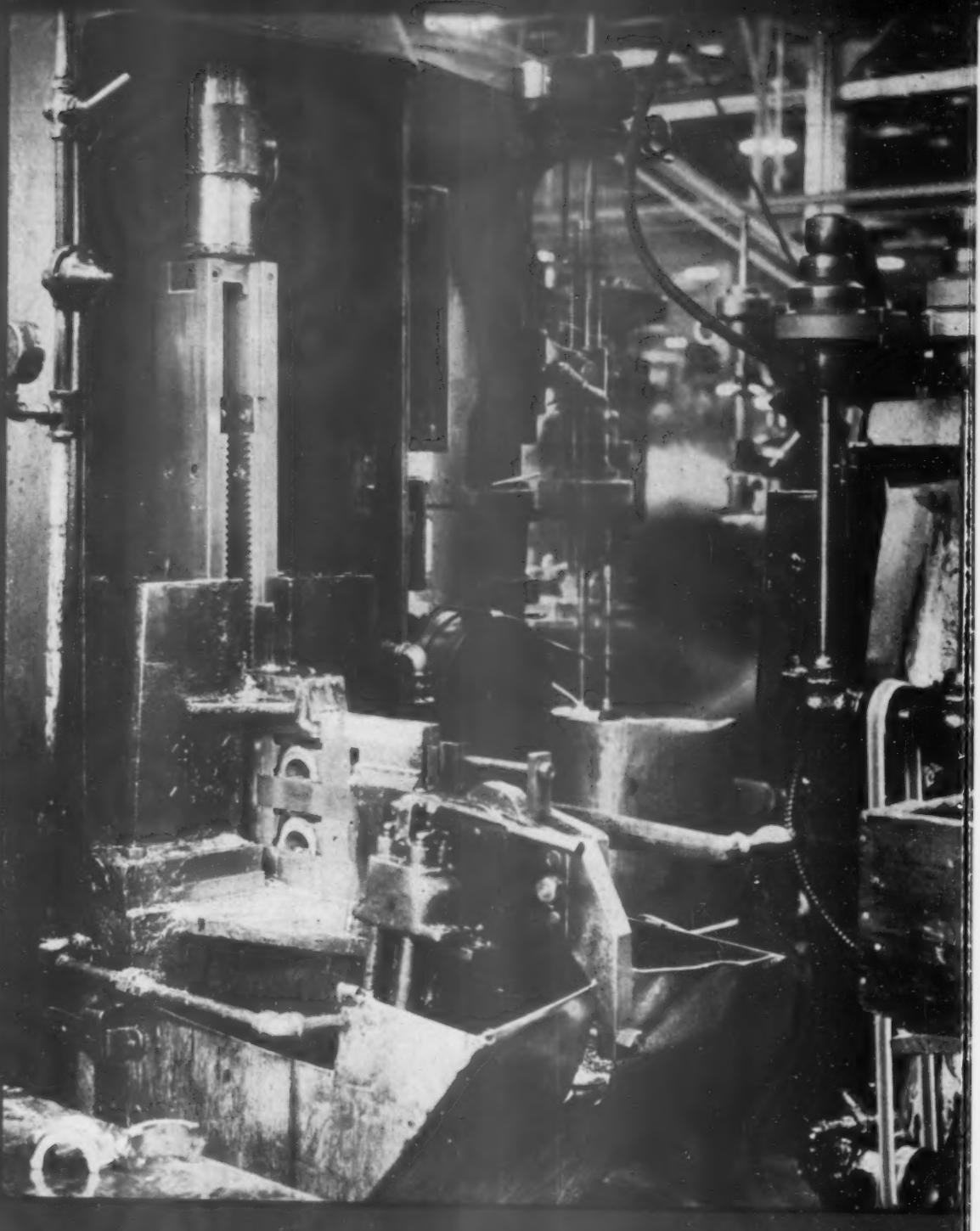


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Journal
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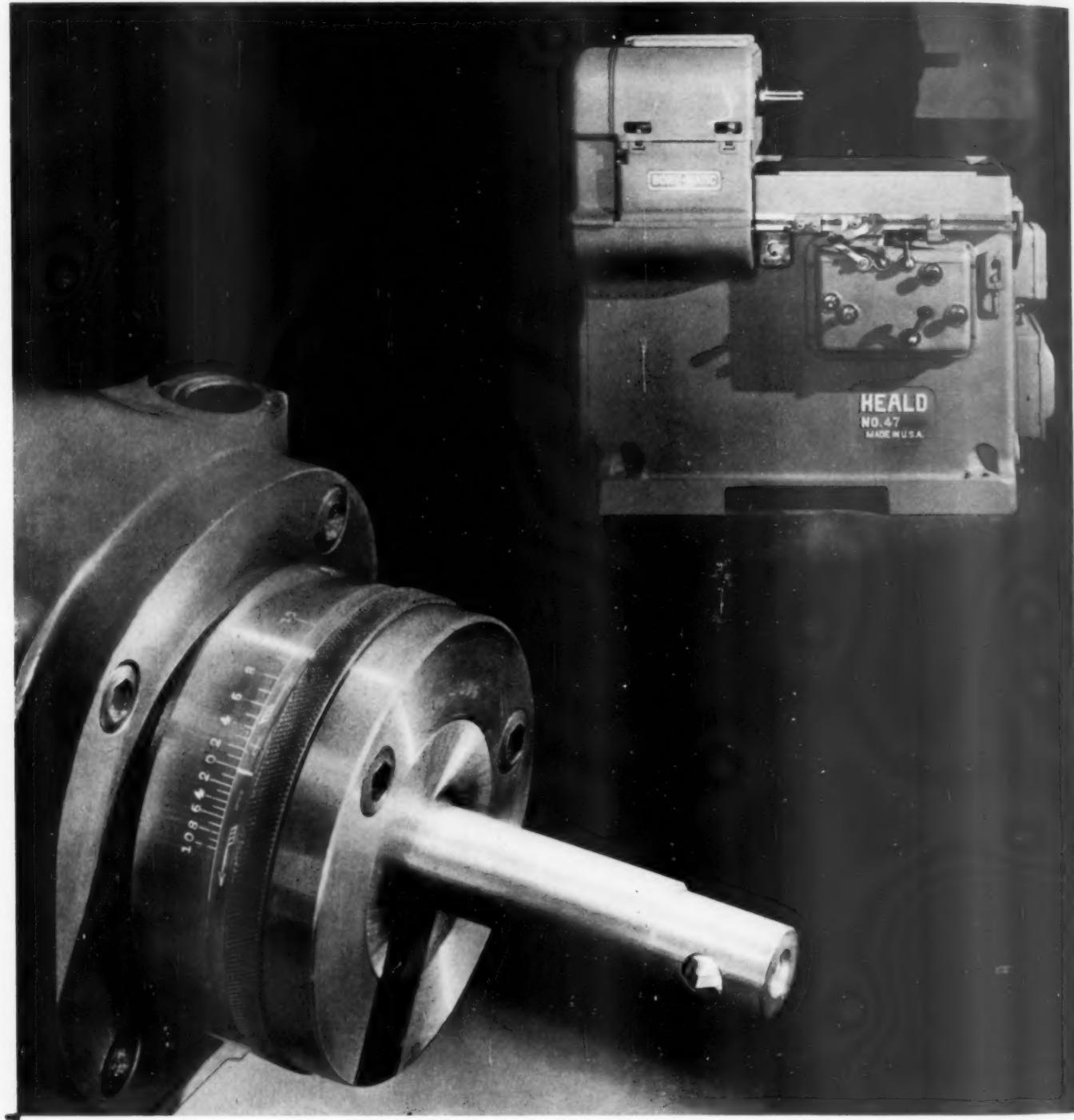


See Page 8.

The A.S.T.E. Journal

AMERICAN SOCIETY OF TOOL ENGINEERS





Tool Adjustment when PRECISION BORING

SATISFACTORY operation of a Precision Boring Machine is dependent to a large degree on the boring head and tool maintenance. The Heald Boring Head Unit is of the Red Head design with Heald super-precision bearings which construction has proved so successful on all grinding machines.

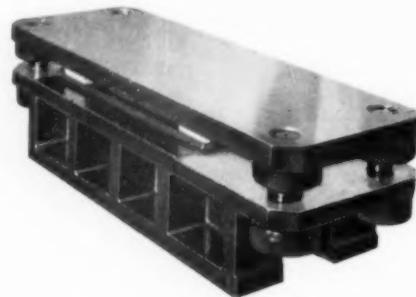
With the tools, not only is it necessary to have them properly sharpened but their adjustment in relation to the

surface being machined is of vital importance, especially where the working limits are close. As illustrated above on the Heald Boring Head, by using a flange spindle and piloting the quill or tool holder to it eccentrically it makes possible minute adjustments with direct, large-scale readings and offers the maximum of protection against foreign substances getting into the mounting.

A bulletin describing the many other features of the Heald Bore-Matics will be gladly sent on request.

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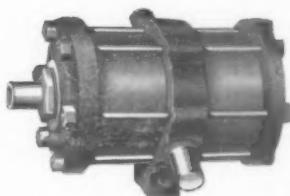
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JOB SHOPS HAVE A BETTER CHANCE OF SURVIVING DEPRESSIONS

By I. TANN, University of Michigan

Frequently, we hear of large production shops going into bankruptcy or receivership despite the fact that not so long ago they were obtaining a good portion of the existing business. We are puzzled when we know for a fact that there are many other companies in existence that have been getting less than their proportion of the existing work, and yet they have been able to survive the worst of the depression and, in many cases, have stayed "out of the red." It is not a question of management, for companies can be cited which have had as good a system as the average and still they have gone under. It is rather, in a number of cases, a question of obligation on the part of the company in the form of stocks.

When starting a large organization which has a promising future, more money is needed for this enterprise, as a rule, than the owners or executives have at hand. They have to resort to some means of securing capital and a good way of obtaining this is by selling stock in the company. Usually they sell about fifteen per cent more than they really need, and store the remainder of the money in vaults. These stocks are dividend bearing, and every stockholder gets his share of the net profits. This means that enough business has to be done to satisfy the demands of the stockholders as well as those of the executives. Perhaps a number of shops would have been all right if they had stopped there, but such organizations, instead of issuing cash to satisfy the dividends, have issued part cash and part dividend stock. In other words, they have added to their burden more stock. Thus, it required that much more profit to satisfy the demands of the stockholders. It is true that the capital on this additional stock made it possible for further expansion and development of the corporation, but evidently during this depression, it had its detrimental effect, for there was not enough profit to warrant a favorable dividend for the stockholders.

A company, such as the Ford Motor Company, is a closed organization and differs in that it has no moral or financial obligations in having to pay dividends on outside capital. Small job shops are similar to the Ford Motor Company in that they are owned by one or two individuals and all the clear profits obtained, no matter how small, go right into his or their pockets. Statistics prepared by trade associations confirm the statement that small companies not only have fared better during this current depression, but as a rule, usually are less affected by business slumps than large companies. This, not only applies to production shops and job

The A.S.T.E. Journal is pleased to publish this article, by Mr. Tann of the University of Michigan, as of interest to member tool shop owners and others. Mr. Tann's views are new and indicative of the growing interest and recognition larger educational institutions are giving to tool engineering as a profession and a vocation of high standing and attractiveness.

shops, but applies as well to the banking business. For example, in Detroit the small banks withstood the depression, while the larger group—the fifth largest in the country and another large banking organization have gone under. This adheres to the old familiar saying, "The larger they are, the harder they fall."

There are other important factors that go to boosting the small plant against the large one. Professor Erwin H. Shell, in charge of the Department of Business and Engineering Administration at the Massachusetts Institute of Technology, attributes this ability of a small shop to hold its own during a slump to the spirit of comradeship between the employees and the executives, which leads to superior team work. From the experience of men who have worked in both job shops and in large production shops, it bears out that Professor Shell's deduction is well founded. "In a large production plant," says one toolmaker, "we are working with a boss at our backs and we are afraid to pass up a job until we have thoroughly checked it." A man is handicapped in this way, for with the thought of losing his job, he cannot produce a good and an efficient day's work. In a small shop, a man is given a job and he is free to "tackle" it in whatever manner he wishes. There is no one standing back of him to tell him what not to do. His mind is more active and he is able to determine for himself where accuracy and skilled workmanship are required. He is not afraid of speed, for he knows, and is aware that his boss knows, that this confident speed more than offsets the cost of an occasional error.

Perhaps, to get a clearer understanding, it would be better that a few terms be defined. First, by saying a large production shop, we mean one that manufactures for one's own account, or perhaps for some one else at the same time. A job shop, on the other hand, is a manufacturing establishment which produces parts or supplies on definite order in definite quantities and for definite prices. Consequently, the risk of the job shop in running losses is less than that of the other manufacturers who have no definite purchasers ready to take over and pay for their jobs. While job shops are working to cover a definite and ready demand and thus are able to estimate closely their costs and profits, the other manufacturers are producing for an estimated demand which may not be realized, thus making the risk element much greater. In a production shop, jigs, fixtures, and special equipment are bought or made to increase the production, and if a slump should occur, this extra equipment would represent

(Continued on Page 10)

JUNE MEETING (LAST MEETING UNTIL FALL)

Thursday, June 14

AMARANTH HALL—McDougall and Gratiot Avenues, Detroit

8:30 P.M.

A short business meeting will be held, which will be followed by a buffet lunch and refreshments—also by entertainment.

NOTE—On account of the early advent of warm weather, the Board of Directors recommended cancelling the dinner which usually precedes the monthly meeting and to substitute, instead, a semi-

social meeting thereby necessitating this change in meeting place.

This will be the last meeting until fall. A nominal charge of fifty cents will be made to cover the extra expenses of this meeting. Since tickets will not be sold in advance, the committee asks that members, who formerly sold tickets, canvas other members and report all reservations to the Secretary's office.

SPECIAL NOTICE

A.S.T.E. ANNUAL PICNIC --- JUNE 24

The second annual A.S.T.E. Picnic will be held on Sunday, June 24th, 1934. The place selected for this extra special occasion is a beautiful grove, including a pavilion, kitchen, refreshment stand, tables, benches, baseball diamond, athletic equipment and so on, is located on Utica Road one mile west of Schoenherr Road. Drive out Gratiot to Roseville, turn west on Utica Road $4\frac{1}{2}$ miles to grounds—or, drive north on Schoenherr Road to Utica Road and turn west one mile to grounds.

The committee is jubilant over the fact that The A.S.T.E. will have exclusive use of the grounds for the entire day.

GET TICKETS FROM COMMITTEE OR AT GROVE—THIS IS A REAL EVENT.

PICNIC WILL BE HELD RAIN OR SHINE

TRY THE SIEWEK FIXTURE ON YOUR NEXT JOB
Positive locking, easy release



"SALESMAN"

by J. E. BULLOCK*

ABOUT RWF. Back in 1908 he was working for Schuchardt and Schutte, in New York City. They had a big line of foreign equipment, mostly German, and the young man was hanging around the office doing general inside work. He was a real machinist, and they sent him out on a trouble job or two. He was lucky or scientific, or something, as he invariably came back with the bacon. They asked him how he would like to go on the road to sell for them in earnest. He said he would try anything once.

Up in Worcester, Mass., the X Company had just brought out the first of the friction head lathes—the machines that made high speed steel tools necessary. Schuchardt and Schutte were marketing a new high speed steel, the "Poldi" brand, made in Germany by the Felix Bischoff Company. They had been working on the X Company by mail, and had had a man call there a couple of times, without the slightest success. Mr. X. was a tough prospect, who declined to interest himself in the new steel and its possibilities. Schuchardt and Schutte simply gave our hero some expense money and instructions to run up to Worcester and sell Mr. X. some "Poldi" steel. Just like that.

RWF got to Worcester in the late afternoon. During the evening in the hotel, he got into conversation with an old-timer who had been selling tool steel in the territory for years. He expanded a bit under the influence of something or other, and told the youngster the system for selling steel in that locality was as follows:

"Just send in your card for the first year. You won't see anybody. During the latter part of the second year, if you keep right on calling, they may come out and tell you they don't need anything in your line. After three years they probably will admit that they are interested, and may even listen to what you have to say, if you make it snappy enough. In the fifth year you may pick up a stray order here and there, and after that, if the product has merit, you may get some steady business." Encouraging.

Bright and early the next morning RWF was in the lobby of the X plant. A cubby window was opened and the lower half of a frosty face asked him what he wanted. He handed in his card. Click went the window. It opened again in a minute and: "Mr. X. says he is not interested." Click. That was that. The oracle of the night before apparently knew his stuff.

The young man put in the rest of the day tramping the streets and making calls. Not a sign of an order. He was back in the X lobby at eight-thirty the next morning. The window opened. In went the

card. Quite a wait this time. At last the office door opens a few inches. A thin, gray man stands there. He tells the supplicant, with more than a trace of irritation in his voice, that, as he said yesterday, he is not in the market for steel of any sort. Bang, and the door was closed. Chapter two. "Well," said RWF to himself, "I'm in my second year already."

At eight thirty again the next morning, the "Poldi" card went through the little window. No delay in getting action this time. Remember the old movie scene where Mephistopheles booms into the picture from nowhere, with a burst of smoke and fire? That was the way Mr. X. seemed to come into the presence of RWF.

Quite a conversation ensued. That is, it would have been a conversation if the salesman could have gotten in even one word. Mr. X. dwelt upon the effrontery of salesmen in general, and of this one in particular, and went on at great length about the nerve of some peoples' children, etc., etc. He ran out of steam shortly and stood there a minute to see if the victim were properly shrivelled. He did not seem to be. He just grinned and reached into his bag and held out a short piece of steel for Mr. X. The gentleman was nonplussed, not to say stunned and overcome. He took the steel and looked at it.

Bang, bang! Our hero went into action with both guns. Mr. X. heard more about the virtues of a bar of steel in the next two minutes, than any man has heard before or since. He shook his head like a fighter does at about the nine count, and asked RWF a question or two. The answers he got led him to ask more. He asked many more, and soon saw he was talking to a person who was up and coming on the subject of lathes and tools and speeds and feeds and on the general production picture of the day. "Come with me," said Mr. X.

RWF followed him down into the plant. A man was running one of the new lathes, turning up a cast iron flange about 11" in diameter and 2" thick, with a hub 4" in diameter and 3½" long. It was chucked on the flange with the shallowest consistent bite, and had to be finished all over, back as close to the jaws as possible.

Mr. X. and RWF stood there and watched the operator finish a piece. Nine minutes. RWF went into his bag again and brought out a tool bit of the right size. He asked Mr. X. if he might put it into the tool post and turn up one of the castings. Okay. A minute on a grinding wheel, and another minute or less to set the tool, and RWF was under way.

Crunch! He fed the tool deep in under the scale on the OD of the flange. He fed it then across the

*A.S.T.E. Member

THIS MONTH'S COVER

Broaching Thrust Faces of Connecting Rod Caps at the Plymouth Plant

By E. H. H. GRAF*

In the Plymouth Plant of the Chrysler Corporation thrust faces of connecting rod caps are being broached from the rough. After assembling cap and rod these thrust faces are finish ground before assembly in motor. Two caps are placed one above the other in an air operated shuttle type fixture mounted on an Oilgear 10-Ton Vertical Allsteel Sideplate machine. Two tools are suspended from the ram of the machine. These tools straddle-broach the two caps at one pass, thus finishing two parts per cycle of the machine. The sequence of operations is as follows:

1. Operator places two caps in fixture.
2. Operator clamps parts and shifts air valve, causing shuttle fixture to carry work beneath tools.
3. Operator starts machine down.
4. Upon completion of cutting stroke shuttle fixture carries work away from tools.
5. Ram is reversed by operator.
6. Operator unloads and loads fixture.

You will note that by shuttling the fixture strip broaching is avoided.

At this point it would be well to compare the production obtainable on this machine to that obtainable on the milling equipment which it has replaced. One man operating the broach produces 3500 caps in eight hours. The milling equipment produced approximately one-third of this or about 1150 caps in eight hours. In addition to this we find that the initial investment for broaching machine and tools is considerably less than the cost of the milling equipment.

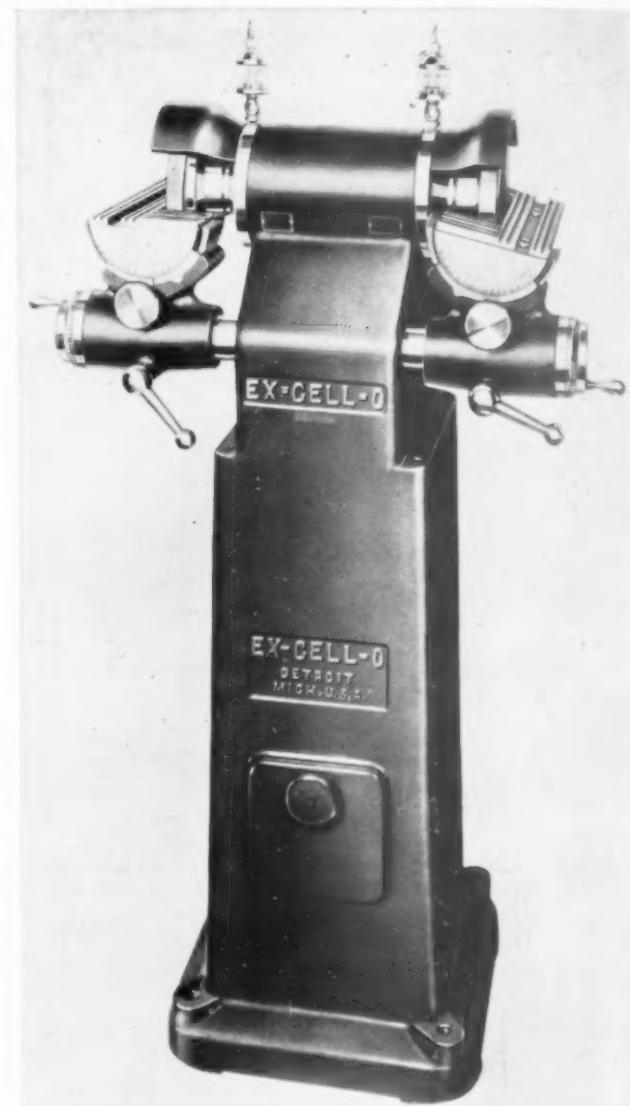
I believe it well worth while to consider some of the general features of this particular machine. First, the force required to broach is applied directly above the tools as there is no overhang nor off-center load. The matter of tooling is now a comparatively simple problem as any one of several first class manufacturers of broaching tools is more than qualified to design and build such tools. The machine itself is of welded steel construction equipped with an Oilgear RSA-5 piston-type pump. Its principle features are that it is strong, fast, compact, accurate, and inexpensive. It is also noteworthy that, due to its simplicity, maintenance on this machine is negligible. Tool upkeep also, is very low.

*A.S.T.E. Member

EX-CELL-O GRINDING AND LAPPING MACHINE

A new model Grinding and Lapping Machine has been placed on the market by Ex-Cell-O Aircraft & Tool Corporation, Detroit, Michigan. The machine is designed for sharpening cemented carbide tipped tools.

Through the introduction of hardened and ground plates, as illustrated, on the surface of the tables at each end of the machine, greater accuracy can be maintained. These strips reduce wear on the surface of the table and make it easier to keep the top of each table clean while the machine is in operation.



These strips are mounted on adjustable "U" shaped tables which have a horizontal micrometer adjustment. Two hardened and ground strips are mounted parallel with the face of each wheel, on top of the table. Two eccentric pins are placed between these strips to aid in aligning them properly. These strips form a slot which acts as a guide for the tool support. Across the ends of each table

GRINDING MACHINES AND A TRADE MARK—

THE LANDIS trade mark reproduced below has been quite a familiar one to automotive men for years. We feel that it is respected highly, for we have always honestly tried to produce grinders of quality and real value.

Today's Landis machines are just as worthy of this trade mark as any of their predecessors. And they will reduce costs more than ever before. Whether you use Plain, Universal, Internal, Crank, Cam, Piston, Ball Race, Valve Face, Side Gear or Cutter and Tool Grinders there is a modern Landis that will more likely than not prove a profitable investment.



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(PATENT PENDING.)

and in front of each wheel is mounted another hardened and ground plate. "U" slots are machined lengthwise in each strip.

An inbuilt balanced motor with double-end shaft projection is mounted at the top of the main casting. The motor is rated at $\frac{3}{4}$ H.P., 3450 R.P.M., and can be furnished for either 220, 440 or 550 volt, three-phase, 60 cycle current. Ex-Cell-O Precision Ball Bearings are used on each end of the motor, thereby eliminating end play. Suitable dust caps are provided to protect the bearings from dirt and foreign material.

The ring type grinding wheel is used at one end of the motor. It is mounted on a steel plate with countersunk holes for the mounting screws. This wheel is cupped and permits the use of the entire thickness of the grinding wheel. The wheel is 6" in diameter with a $1\frac{3}{4}$ " grinding surface on the side of the wheel. Softer wheels are used on this machine due to its unusual rigidity.

The special iron lapping disc is 6" in diameter, $\frac{3}{4}$ " thick, with a $1\frac{3}{4}$ " lapping surface on the front of the disc and a $\frac{3}{4}$ " lapping surface on the back.

(Continued from Page 2)

$1\frac{3}{4}$ " length, and then straight down the face, keeping under the scale all the time. He began to speed up the lathe as the diameter being turned, grew smaller. The chips were flying off there, and real chips they were too. Down to the hub travelled the tool. It began to reduce the OD of the hub, still under the scale, and with the lathe speeded up again. Along the length of the hub, and then, with a final burst of speed, down across the end, and the piece was done. The whole trip without the tool coming out from under the scale. Time, by the watch in Mr. X's hand, three minutes.

"Run another one," said Mr. X. Several of the hands had left their machines by now, and were around this lathe, watching the demonstration. "Look at this boys," shouted M. X.

They saw another casting machined in three minutes, and then another, and then several more. "Let me try one," said the old gentleman, taking off his coat and hanging it on a post. He finished his, in considerably less than three minutes. That was just the required touch. He wiped his hands, and put on his coat. "Take a piece of paper and follow me, young man," he said.

They went to every lathe in the plant and took the size of steel required for the various tool posts. Then back to the office. "My! Five years, and it seems like yesterday," thought RWF.

"How much is that steel a pound?" RWF told him. "All right, give me a bar of every size I need. Write your own ticket on this blank. I'll sign it."

RWF, in his inexperience, neglected to tell Mr. X that the bars were sixteen feet long. It was quite an order.

I asked RWF how long he figured that steel lasted the X company. "Well," he said, "I don't know how busy they've been since 1908. . . . I never got to go back there. Schuchardt and Schutte sent me to Shanghai, to sell a shop full of arsenal equipment to the Chinese Government."

When a large number of right and left-hand tools are to be ground on the same machine, a motor reversing switch should be installed.

William Fors Joins Goudie Sales

William J. Fors has become associated with the D. O. Goudie Sales Co., 2832 E. Grand Blvd. in the capacity of Vice-President and in charge of sales for the Apex Machine & Tool Co. of Dayton, Ohio; Ready Tool Co. of Bridgeport, Connecticut; and the Quality Tool Works, of Waukegan, Ill.

The Apex Machine & Tool Co. manufacture Quick Change Chucks, Safety Friction Chucks, Floating Tool Holders, Universal Joints, Universal Joint Nut Setters and Socket Wrenches.

The Ready Tool Co. manufacture Ball Bearing Centers, Hi-Speed Steel Centers, Federal Points, Lathe Tools, Shaper Tools, Cutting Off Tools, Milling Machine Dogs, etc.

Quality Tool Works manufacture Woodruff Key-way Cutters and Milling Cutters exclusively.

(Continued from Page 5)

a large loss, for it would not produce enough to pay for itself. A job shop does not employ very much of this special equipment, for it does not make enough of one piece to warrant its use.

Along with the production end of a large shop comes the sales end. If business is bad, the sales organization is not decreased, but rather increased, making the overhead that much greater. A large number of the office employees are needed to keep the office routine running, even though there is little work to be done.

A small job shop, by its very nature, has a low overhead which can be cut more easily during a time of depression than can a large organization, even if the few executives have to take their own coats and hats off to do it. In fact that was the actual case in a number of shops where the foreman, in order to keep busy, helped with the jobs and thus saved the cost of hiring an extra man or two.

Let us take an average job shop and assume that in 1933 it did \$100,000 work of business, out of which \$20,000 was spent for material, and \$60,000 for labor, leaving a balance of \$20,000. The fixed overhead was \$48,000, which consisted of administrative expenses, taxes, insurance, depreciation, and so on, showing a net loss of \$28,000. However, the depreciation alone consists of \$25,000 on a quarter of a million dollars worth of equipment. The owner was not compelled to raise this \$25,000 for depreciation, and not taking this \$25,000 into account, his losses would be only \$3,000.

Thus, we can see that a small job shop has a number of ways to overcome its overhead when it has to, while a large production shop, although it can cut down some, has to carry most of the overhead through the depression and, if it is overburdened with stock, it is analogous to driving a boat with the anchor down and with a faulty motor.

J. E. S.
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COUNTERBORES

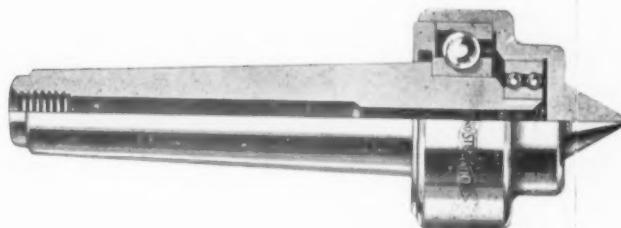
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ENGINEERED PRODUCTION

EXAMPLES FROM THE SUNDSTRAND FILES

No. 3410

Lathes
Milling Machines
Tool Grinders
Centering Machines
Balancing Tools

They Wanted Lots of Accurate Turning They Bought a Battery of Stub Lathes

Early in 1934 our Engineered Production Department was asked to quote on turning and grooving equipment for accurate high production on piston rings. Result—an order for the three Stub Lathes shown in Fig. 1; together with tooling, shown close-up in Fig. 2. Twenty-four rings are mounted on an arbor in four groups of six each. Arbor is placed in Stub Lathe and cycle started. Tools feed to depth; feed to left, turn O. D. on the four groups of rings simultaneously at high speed and then retract slightly, motor slows to half-speed, rear tools groove all rings and retreat, feed releases. During this automatic cycle the operator is busy loading another arbor. When he returns the front carriage to starting position, the motor switch automatically re-sets to high speed. Production figures are confidential but they are high, and Stub Lathes can duplicate them on any similar work.

This is only one of a number of operations that Sundstrand Engineered Production has handled effectively for piston ring manufacturers. We have supplied a large amount of Sundstrand equipment for all of the standard turning and milling operations in piston ring production, and for many special operations.

We refer to these three Stub Lathes as a battery merely because they were all in one shipment. In the leading plants of the world there are many very large installations of Stub Lathes and Rigidmils. Some of these were delivered in one shipment, others developed as the result of repeat

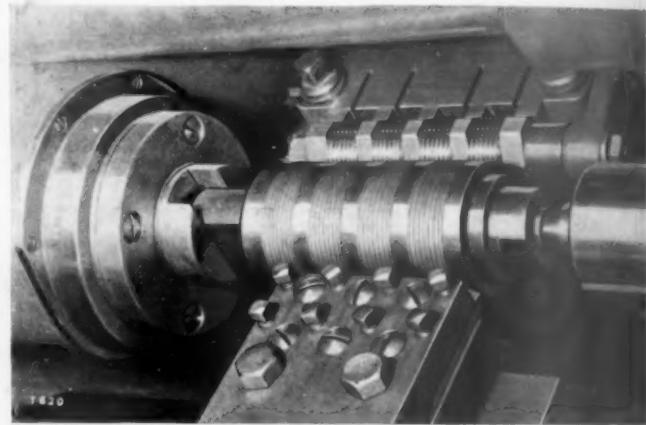


Fig. 2. Close-up of piston-ring turning and grooving set-up.

orders. Performance in every instance was satisfactory, and it often exceeded our estimates or the expectations of the purchasers. Sundstrand Engineered Production and Machine Tools pay the user well, and we are glad to co-operate in developing their uses to best advantage.

STERLING - FRENCH MACHINERY CO.
NEW CENTER BUILDING • DETROIT, MICHIGAN • PHONE MADISON 3660
Exclusive Sales Representatives for Sundstrand Products in the Detroit Territory

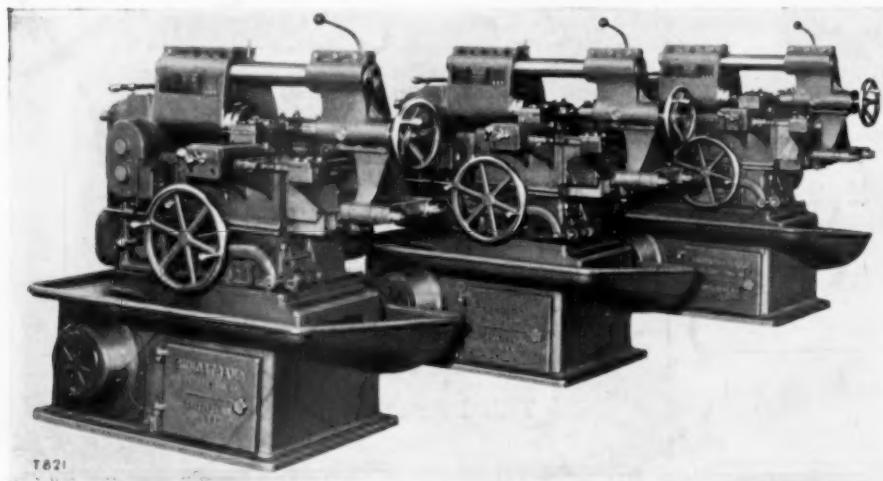


Fig. 1. Three Stub Lathes equipped for piston-ring turning and grooving.



NEW DIRECT-WIRE SERVICE

The Sundstrand offices are completely equipped with recently perfected devices for transmitting written as well as verbal messages by *direct wire* to and from all parts of the world. This new service provides greatest speed, convenience, and accuracy in communication; just as Sundstrand machine-tools provide the same qualities in production.

